

Analysis of acute presentations for child protection medical assessments in a large, culturally diverse metropolitan setting

Paul Rex Hotton,¹ Shanti Raman^{1,2}

To cite: Hotton PR, Raman S. Analysis of acute presentations for child protection medical assessments in a large, culturally diverse metropolitan setting. *BMJ Paediatrics Open* 2017;1:e000120. doi:10.1136/bmjpo-2017-000120

Received 30 May 2017
Revised 26 July 2017
Accepted 28 July 2017

ABSTRACT

Objective South Western Sydney has a large culturally diverse population with many vulnerable subgroups; little is known about the health and social outcomes following acute child maltreatment assessments. We aimed to describe acute presentations of maltreatment in South Western Sydney—including examination findings of the assessment, determine health and social outcomes for children following medical assessment, to inform service development.

Design We gathered data from the acute child protection database on all children <16 years referred for physical abuse and neglect and/or sexual abuse assessment between 2013 and 2015 to one hospital service. We reviewed clinical records of the children assessed, using the reports to classify findings of the examination. We performed simple descriptive analysis on the data.

Results There were 304 children referred, 279 seen for acute assessment. Most (72%) were female, 204 (73%) referrals were for sexual abuse, 75 (27%) were for physical abuse and neglect. There were age, gender and ethnicity differentials depending on type of maltreatment presentation. Twelve per cent of sexual and 19% of physical abuse cases were found not to be abuse related. Unmet medical, developmental and behavioural concerns were identified in the majority (54%) assessed. Just under half (48%) of all children went home with families with no statutory agency support; those seen for physical abuse were more likely to be placed in care ($p<0.001$).

Conclusions Children assessed for child maltreatment had a range of health and social concerns identified, needing further intervention. Comprehensive medical assessments have a critical role to play in child protection assessments.

INTRODUCTION

Child maltreatment (CM) is now acknowledged as a global public health and social welfare problem, with known significant short-term, medium-term and long-term health consequences.^{1–6} Over recent decades, there has been an increased focus on the health needs of maltreated children,^{6–8} along with targeted health services and clinical assessments guidelines.^{9–11} A comprehensive medical assessment

What is already known on this topic?

- ▶ A comprehensive medical assessment is an essential component of child maltreatment assessments.
- ▶ Maltreated children are more likely to be hospitalised and use frontline services.
- ▶ Child maltreatment assessments are important for forensic purposes but may identify other health concerns.

What this study hopes to add?

- ▶ Child maltreatment medical examinations can be used to help identify unmet health and welfare needs of the child.
- ▶ There are differences in the health, social and welfare outcomes when comparing sexual abuse and physical abuse assessments within a metropolitan region.
- ▶ There is significant variation in age, gender and ethnicity in children presenting for child maltreatment assessments.

is an acknowledged essential component of a multiagency investigation of CM.¹⁰

Maltreated children are more likely to be hospitalised and use frontline services such as emergency departments and paediatric departments.^{12–14} There is now good evidence for performing comprehensive medical assessments for acute presentations of CM,² not just for forensic purposes but because of the high yield of health concerns identified.¹⁵ What is not known is the health, social and welfare outcomes following acute assessments for CM or the quality dimensions of these assessments. South Western Sydney (SWS) Local Health District is the largest, most populous region in Australia, with a substantial child and youth population.¹⁶ It is a rapidly growing metropolitan population in the state of New South



CrossMark

¹Department of Community Paediatrics, South Western Sydney Local Health District, Sydney, Australia

²School of Women's and Children's Health, University of New South Wales, Sydney, NSW, Australia

Correspondence to

Dr Paul Rex Hotton; paul.hotton@health.nsw.gov.au

Wales (NSW), Australia, with a culturally and linguistically diverse population and many subgroups who are socially and economically at risk within its boundaries.¹⁷ Raman *et al*¹⁸ previously identified a wide variation in clinical practice in acute assessment for child physical abuse and neglect (PAN) from a quality audit conducted in SWS. Following that audit, the Community Paediatrics team in SWS made improvements to clinical assessment processes, which included the establishment of a joint clinic made up of community paediatricians (CP), social workers and sexual assault physicians. A model of collaborative multidisciplinary clinical assessments for acute CM in one hospital (a non-tertiary paediatric hospital) setting was established.

Our aims were to describe the acute presentations of CM to this collaborative clinical service, including the examination findings, health concerns and social outcomes for children following the clinical and/or forensic medical assessment. The results of this service evaluation would further feed back into clinical service improvements in SWS, thereby contributing to and sustaining the quality improvement process.¹⁹

METHODS

We collated data gathered from the acute child protection databases for all referrals for acute assessments to one hospital service in SWS of children and youth (<16 years old) between 1 January 2013 and 31 December 2015, including PAN and sexual assault (SA). These data

were derived from two databases, one established by CP and the other from SA services. Those children that appeared in both databases for the same assessment were categorised as a joint assessment conducted collaboratively by CP and SA physicians. Only children referred to this hospital service were analysed. Other children within SWS that may have presented to other services within the area were not included in this study.

We reviewed all the clinical reports, clinical notes and follow-up plans of children seen for CM assessments. Demographics, referral details, forensic, clinical and social outcomes were recorded from the available data. The term forensic assessment is used for CM assessments that were conducted specifically for criminal proceedings, done at the request of the Joint Investigative Response Team (interagency team including Community Services, police and health) or the police to aid legal matters.

We used the conclusion of the medical or forensic notes and reports to classify the findings of the medical examination (table 1). The health needs identified in the reports were classified as medical, developmental/learning and behavioural/mental health or a combination of two or all areas. The referring services were contacted to find out what happened to the children following their acute assessments and whether any criminal proceedings had occurred. Social outcomes were divided into whether the child went home with their family with or without community

Table 1 Categories of findings from medical assessment

SA	Description
Definite evidence of abuse	Includes witnessed sexual molestation, gonorrhoea infection
Anogenital injury	Injury consistent with suggestion of penetration, not including straddle injury
No anogenital findings	Examination was normal, cannot confirm penetration or deny
No injury, other CM concerns	Examination was normal; however, other CM concerns were identified during the assessment
Not consistent with abuse concerns	Includes findings of normal/variant vaginal examination with no disclosure/behavioural change, finding other conditions that mimic, that is, lichen sclerosis, or accidental injury such as a straddle injury.
Refused examination	Child declined consent for the examinations and therefore unable to assess the genitals.
PAN	Description
Definite inflicted injury	This included pattern bruising, unexplained posterior rib fractures, reliable eyewitness of abuse, highly suspicious injury (pinna bruising)
Suspicious for inflicted injury	Includes history inconsistent with injuries, multiple severe injuries of different age without explanation, concerning injury with no mechanism.
Unclear for abuse	Insufficient information to offer an opinion, non-concerning injury but past suspicious injury with same caregiver, sequence of events clear but uncertain whether they constitute abuse.
Unclear, other CM concerns	Unclear; however, the assessment revealed other CM concerns
Accidental injury, not concerning for abuse	Mechanism explains the injuries with consistent history, conditions that mimic abuse, that is, Mongolian spots. Those injuries were either typical of normal play or there was a witnessed and/or credible parental story of injury.

CM, childmaltreatment; SA, sexual assault.

Table 2 Demographic description, referral and assessment details of acute child maltreatment assessments, South Western Sydney 2013–2015

	Sexual abuse SA Dr only n=134 (48%)	Sexual abuse joint n=70 (25%)	Physical abuse and neglect n=75 (27%)	Total n=279
Age (median)	13 years*	5.5 years	3.5 years	7 years
IQR	6.3–14 years	3.2–9 years	1.5–8 years	3–13 years
Gender				
Male	12 (9%)	20 (29%)	45 (60%)	77 (28%)
Female	122 (91%)*	50 (71%)	30 (40%)	202 (72%)
Ethnicity				
Anglo–Australian	28 (21%)	29 (41%)	20 (27%)	77 (27%)
Aboriginal	17 (13%)	13 (19%)	9 (12%)	39 (14%)
Pacific Islander	8 (6%)	7 (10%)	20 (27%)	35 (13%)
Middle Eastern	13 (10%)	9 (12%)	12 (16%)	34 (12%)
Asian	8 (6%)	5 (7%)	8 (10%)	21 (8%)
European	3 (2%)	4 (6%)	3 (4%)	10 (4%)
African	5 (4%)	2 (3%)	2 (3%)	9 (3%)
Other	2 (1%)	1 (2%)	1 (1%)	4 (1%)
Not documented	50 (37%)	0 (0%)	0 (0%)	50 (18%)
Referring agency				
JIRT	77 (56%)	59 (85%)	29 (39%)	165 (59%)
Police	33 (25%)	1 (1%)	1 (1%)	35 (13%)
CS	3 (2%)	4 (6%)	21 (28%)	28 (10%)
Emergency doctor	19 (14%)	1 (1%)	6 (8%)	26 (9%)
Paediatrician	0 (0%)	4 (6%)	17 (23%)	21 (8%)
Other	2 (1%)	1 (1%)	1 (1%)	4 (1%)
Who assessed				
SA Doctor	134 (100%)	0 (0%)	0 (0%)	134 (48%)
Joint (SA and CP)	0 (0%)	70 (100%)	0 (0%)	70 (25%)
Community paediatrician	0 (0%)	0 (0%)	59 (79%)	59 (21%)
Paediatricians	0 (0%)	0 (0%)	16 (21%)	16 (6%)
Type of assessment				
Medical	55 (41%)	63 (90%)	48 (64%)	166 (59%)
Forensic	65 (49%)	5 (7%)	27 (36%)	97 (35%)
Refused examination	14 (10%)	2 (3%)	0 (0%)	16 (6%)

*p value <0.001.

CP, community paediatricians; CS, Community Services, statutory child protection agency; JIRT, Joint Investigation Response Team, comprising health, welfare and police; SA, sexual assault.

services involvement or whether they were placed in out-of-home care.

ANALYSIS

Relevant data extracted from the databases were entered into an Excel spreadsheet and simple descriptive analysis of the data was carried out using IBM SPSS Statistics for Windows, V.23. Mann-Whitney U test and χ^2 tests were used to determine difference in proportions.

Ethics approval was obtained via the lead Human Research Ethics Committee at Liverpool Hospital.

RESULTS

Over the 3-year period (2013–2015), 304 cases were referred for an acute CM assessment, of which 25 (8%)

were phone consultations. There were 279 cases seen for an acute assessment, 204 cases (73%) were seen for SA and 75 cases (27%) were for PAN assessments. Of the 279 cases, 15 cases (5%) seen were siblings of an index child and one child was seen for neglect.

Table 2 lists the demographics, referral and assessment details of children seen. Median age of all types of assessments was 7 years (IQR 3–13 years); there were differences in age, gender and ethnicity depending on type of presentation. Median age of children presenting for all SA assessments was 10 years (IQR 4–14 years), for PAN was 3.5 years (highly significant, Mann-Whitney U test Z score=6.84, $p<0.0001$). Girls were three times more likely to be seen for an acute CM assessment than boys, and females were more likely to present for acute SA assessments (χ^2 53.89, $p<0.001$). The majority of the children

Table 3 Clinical examination findings: sexual assault (SA) assessments

Findings	Total n=204	SA medical only n=134	Joint assessments n=70
Definite evidence of abuse	3 (1%)	3 (2%)	0 (0%)
Anogenital injury	17 (8%)	14 (10%)	3 (4%)
No anogenital findings	91 (45%)	78 (59%)	13 (18%)
No injury, other child maltreatment concerns	53 (26%)	10 (8%)	43 (62%)
Not consistent with abuse concerns	24 (12%)	15 (11%)	9 (13%)
Refused examination	16 (8%)	14 (10%)	2 (3%)

seen for CM assessment were identified as Anglo–Australian (27%) with high numbers of Aboriginal and Pacific Islander children. Ethnicity was not documented in 37% per cent of SA assessments carried out by the SA doctors. Police and/or child protection agencies made 82% of the referrals for acute assessments. A third of the SA assessments were joint (CP/SA) assessments. A third of all assessments were for forensic purposes.

Table 3 lists the clinical findings from SA assessments, 12% seen for an acute SA assessment had findings not consistent with abuse concerns while 9% of SA assessments had definite evidence of abuse or anogenital injury. The majority of SA assessments (71%) had normal genital findings, 26% of all SA assessments (62% of the joint SA assessments) identified other CM concerns. Table 4 lists the clinical findings from PAN assessments, 14% were not concerning for abuse, 39% were definitive or suspicious for inflicted injury, 28% of assessments identified other CM concerns. Overall, 30 (11%) of all CM assessments found no concerns for abuse.

Table 5 lists health and social outcomes following CM assessments; 151 (54%) of the 279 children examined had other health concerns identified during their acute assessment. A quarter of the unmet needs were medical which included dental caries, incomplete immunisation, growth and nutrition, pneumonia, hearing issues, missed

Table 4 Clinical examination findings: physical abuse and neglect (PAN) assessments

Findings	n=75
Definite inflicted injury/abuse	6 (8%)
Suspicious for inflicted injury	23 (31%)
Unclear for abuse	11 (14%)
Unclear, other CM concerns	21 (28%)
Not concerning for abuse, accidental injury	14 (19%)

vision screening, skin infections and current gastroenteritis. Learning concerns included developmental delays or issues with cognition and learning at school and this was an issue for 28 children (19%). Twenty-one children (14%) had unmet mental health or behavioural issues which included depression, suicidal ideation, emotional dysregulation, attention deficit hyperactivity disorder, obsessive compulsive disorder and eating disorders. All three health concerns were seen in 25 children (17%). For SA assessments, joint assessments were better at identifying health concerns for children than those assessments carried out by SA physicians solely ($\chi^2 = 72.33$, $p < 0.001$). Just under half of the children seen for all CM assessments went home with their families with no child protection statutory agency support; those seen for SA assessments were more likely to go home with their parents ($\chi^2 = 75.74$, $p < 0.001$). Just under half of PAN assessments resulted in children being placed in care ($\chi^2 = 24.32$, $p < 0.001$). Fifteen per cent of the cases seen for a CM assessment resulted in the person of interest charged.

DISCUSSION

In this study of CM medical assessments in metropolitan Sydney, more than half of the assessments identified other health concerns, in keeping with other international research.^{15 20} In a quarter of assessments, multiple types of CM were identified in children who presented with one type. We identified age, gender and ethnicity differentials in the CM assessments, and health and social outcomes following assessments; all critically important information for planning and responding to CM in this region.

In our study, we found males were more likely to present for PAN assessments, while more females presented for SA assessments, in keeping with much of the international published data.^{21 22} We found that three-quarters of the acute CM assessments were for concerns about SA, less than a third were for physical abuse/neglect; these findings differ from the study from the UK, which showed 52% of assessments were for alleged physical abuse, 36% for sexual abuse and 3% for neglect.¹⁵ This is despite SA being the least likely reason to be referred to child protection statutory agencies both in Australia²³ and globally.^{24–26} This over-representation of SA for clinical assessments in our sample may be due to the need for forensic examination for the purpose of collecting evidence following an alleged assault and the fact that we had access to a specialist SA team to do this.

There was significant variation in ethnicity in children presenting for CM assessments, with over-representation of Aboriginal and Pacific Islander children, compared with around 2% of SWS and around 3% of NSW populations.^{16 27} The over-representation of black and ethnic minority populations has been well documented in international studies.^{28–30} There is clearly more work to be done to unpack the role and influence of culture, both in heightening and ameliorating risks; there is a complex interplay of sociocultural factors in this arena.³¹ Our data is the basis of

Table 5 Health concerns identified and social outcomes following child maltreatment assessment

Outcomes	SA n=134	Joint n=70	PAN n=75	Total CM n=279
No health concerns identified	99 (74%)	10 (14%)	19 (25%)	128 (46%)
Medical concerns	5 (4%)	16 (23%)	19 (25%)	40 (14%)
Learning concerns	4 (3%)	13 (19%)	11 (15%)	28 (10%)
Behavioural concerns	12 (9%)	4 (6%)	5 (7%)	21 (8%)
Two health concerns	10 (7%)	13 (18%)	14 (19%)	37 (13%)
3+ health concerns	4 (3%)	14 (20%)	7 (9%)	25 (9%)
Total health concerns identified	35 (26%)	60 (86%)*	56 (75%)	151 (54%)
Safety				
Home with family	104 (78%)*	19 (27%)	11 (14%)	134 (48%)
Home with family with CS support	19 (14%)	26 (37%)	29 (39%)	74 (27%)
Placed in out-of-home care	11 (8%)	25 (36%)	35 (47%)*	71 (25%)
Legal				
Proceeded to criminal court	26 (19%)	6 (9%)	9 (12%)	41 (15%)
Person of Interest found guilty	15 (12%)	3 (4%)	5 (7%)	23 (8%)

*p value < 0.001.

CM, child maltreatment; CS, Community Services, statutory agency; PAN, physical abuse and neglect; SA, sexual assault.

another service improvement project that we have carried out in SWS,³² to help understand that gap.

In our study, about 40% of the PAN assessments had findings that were suspicious or definitive for inflicted injury, compared with 9% of SA assessments that confirmed abuse and/or anogenital injury. Of all our CM assessments, 14% were found to have examinations that were not consistent or concerning for abuse. These results are similar to Kirk *et al's* findings from the UK¹⁵; they found that two-thirds of PAN, one-fifth of SA assessments strengthened abuse allegations and 15% of all assessments repudiated allegations. However, the thresholds for referral for SA and PAN assessments are different and may reflect the difference between SA and PAN concerns for suspicious/definitive injury. SA may present via the child's disclosure, whereas physical abuse may present with concerns around physical signs and suspicious injuries that need investigation.

In keeping with the other studies,^{33–36} our findings showed that the majority (71%) of SA assessments had a normal genital examination following allegations or concerns for abuse. This highlights the growing importance of the child's disclosure as well as the importance of doing an assessment soon after the alleged SA.^{35,37} Our study picked up other CM concerns in 26% of SA assessments and 28% of PAN assessments, similar to Kirk's study.¹⁵ This finding supports the understanding that children exposed to one type of CM are often exposed to other types especially neglect, psychological abuse and intimate partner violence.¹

Over half of the CM assessments identified other health concerns and 41% of those children had two or more unmet health concerns in our setting. Our study reflected findings from other international studies,^{15,20,38,39} which shows that CM medical examinations can be used to help identify unmet health and welfare needs of the child. We would argue that an acute assessment for CM goes past

the forensic requirement, is comprehensive in nature and provides holistic care and support to the child and family.

Eighty per cent of CM is perpetrated by parents or parental guardians, apart from SA, which is most perpetrated by other relatives or acquaintances,¹ which explains why nearly half of the PAN assessments resulted in the children being placed in foster care. The overall management of CM cases needs complex decisions based on medical, social, ethical and legal issues, which is beyond the expertise of a single individual or service. Many children will have police involvement; however, as our study showed, only a few lead to criminal proceedings and an even smaller number will the perpetrator of abuse be found guilty. It is hard to know, if at all, whether the medical assessments contribute to that solely; from Hansen *et al's* Danish study,⁴⁰ the child's statement and not the physical findings were important for legal outcome in SA forensic assessments.

Limitations

This collaborative child protection clinical service in SWS is a unique service for CM assessments and, therefore, it may not reflect practice elsewhere. This service certainly does not assess all children with maltreatment needing clinical assessment in the region. There would be a proportion of children, especially those with PAN, who may have been referred directly to other district or tertiary hospitals. Our results show an under-representation of neglect with only one child referred for an acute assessment. We had to rely on what was documented in the clinical records and documentation can be notoriously variable.^{41,42} The conclusion of the report was used to categorise findings and we did not reinterpret the findings. Although there is an extensive proposed classification system for examination findings in SA,⁹ there is no equivalent system for PAN and there is wide variability in the interpretation of physical abuse even among experienced clinicians.⁴¹

CONCLUSIONS

This study describes comprehensively the health needs and social outcomes following acute CM presentations within a defined geographical region in Australia. The findings from this clinical service evaluation can be used to shape better and more targeted clinical services for CM assessments. The medical assessment for CM is not only useful for forensic collection, documenting clinical examination findings and identification of other CM concerns; crucially, it helps to identify health and welfare needs of the child and therefore pathways to intervention.

Competing interests None declared.

Ethics approval Obtained via the lead Human Research Ethics Committee at Liverpool Hospital.

Provenance and peer review Not commissioned; externally peer reviewed.

Open Access This is an Open Access article distributed in accordance with the Creative Commons Attribution Non Commercial (CC BY-NC 4.0) license, which permits others to distribute, remix, adapt, build upon this work non-commercially, and license their derivative works on different terms, provided the original work is properly cited and the use is non-commercial. See: <http://creativecommons.org/licenses/by-nc/4.0/>

© Article author(s) (or their employer(s) unless otherwise stated in the text of the article) 2017. All rights reserved. No commercial use is permitted unless otherwise expressly granted.

REFERENCES

- Gilbert R, Widom CS, Browne K, *et al.* Burden and consequences of child maltreatment in high-income countries. *Lancet* 2009;373:68–81.
- Gilbert R, Kemp A, Thoburn J, *et al.* Recognising and responding to child maltreatment. *Lancet* 2009;373:167–80.
- Cuijpers P, Smit F, Unger F, *et al.* The disease burden of childhood adversities in adults: a population-based study. *Child Abuse Negl* 2011;35:937–45.
- Fergusson DM, McLeod GF, Horwood LJ. Childhood sexual abuse and adult developmental outcomes: findings from a 30-year longitudinal study in New Zealand. *Child Abuse Negl* 2013;37:664–74.
- O'Donnell M, Scott D, Stanley F. Child abuse and neglect—is it time for a public health approach? *Aust N Z J Public Health* 2008;32:325–30.
- Scott DA. The landscape of child maltreatment. *Lancet* 2009;373:101–2.
- Norman RE, Byambaa M, De R, *et al.* The long-term health consequences of child physical abuse, emotional abuse, and neglect: a systematic review and meta-analysis. *PLoS Med* 2012;9:e1001349.
- Springer KW, Sheridan J, Kuo D, *et al.* Long-term physical and mental health consequences of childhood physical abuse: results from a large population-based sample of men and women. *Child Abuse Negl* 2007;31:517–30.
- Adams JA, Kellogg ND, Farst KJ, *et al.* Updated Guidelines for the Medical Assessment and Care of Children Who May Have Been Sexually Abused. *J Pediatr Adolesc Gynecol* 2016;29:588–605.
- RCPCH. *Child Protection Companion*. London: Royal College of Paediatrics and Child Health, 2006.
- Sittig JS, Post ED, Russel IM, *et al.* Evaluation of suspected child abuse at the ED: implementation of American Academy of Pediatrics guidelines in the Netherlands. *Am J Emerg Med* 2014;32:64–6.
- Chang DC, Knight V, Ziegfeld S, *et al.* The tip of the iceberg for child abuse: the critical roles of the pediatric trauma service and its registry. *J Trauma* 2004;57:1189–98.
- Flaherty EG, Thompson R, Litrownik AJ, Theodore A, English DJ, Black MM, *et al.* Effect of early childhood adversity on child health. *Archives of Pediatrics and Adolescent Medicine* 2006;160:1232–8.
- Ziegler DS, Sammut J, Piper AC. Assessment and follow-up of suspected child abuse in preschool children with fractures seen in a general hospital emergency department. *J Paediatr Child Health* 2005;41(5-6):251–5.
- Kirk CB, Lucas-Herald A, Mok J. Child protection medical assessments: why do we do them? *Arch Dis Child* 2010;95:336–40.
- SWSLHD. *Health Profile of Local Communities*. Sydney, Australia: South Western Sydney Local Health District, 2014.
- Morgan K, Eastwood J, Faniran S. *Headline Population Indicators Data Report 2009: A report for the South West Sydney region on key statistics relating to the health and wellbeing of its children and families*. Liverpool, New South Wales, Australia: Karitane and the Department of Community Paediatrics, Sydney South West Area Health Service, 2010.
- Raman S, Maiese M, Hurley K, *et al.* Addressing the Clinical Burden of Child Physical Abuse and Neglect in a Large Metropolitan Region: Improving the Evidence-Base. *Soc Sci* 2014;3:771–84.
- Health NSW. *Easy Guide to Clinical Practice Improvement: A guide for healthcare professionals*. Health Department NSW, ed. Sydney: Better Health Centre, 2002.
- Al-Jilahiawi S, Borg K, Maguire S, *et al.* The value of paediatric assessment in historic child sexual abuse. *Arch Dis Child* 2017;102:1–6.
- Cheng TL, Johnson SB, Goodman E. Breaking the Intergenerational Cycle of Disadvantage: The Three Generation Approach. *Pediatrics* 2016;137.
- MacMillan HL, Tanaka M, Duku E, *et al.* Child physical and sexual abuse in a community sample of young adults: results from the Ontario Child Health Study. *Child Abuse Negl* 2013;37:14–21.
- D'Souza AJ, Russell M, Wood B, *et al.* Attitudes to physical punishment of children are changing. *Arch Dis Child* 2016;101:690–3.
- US Department of Health and Human Service. *Administration on Children youth and Families. Child Maltreatment 2014.25th Year of Reporting*. Washington, DC: US Government Printing Office, 2016.
- Department of Education. National Statistic; Characteristics of children in need: 2014 to 2015. *England UGDS*, 2015.
- Trocmé N, MacMillan H, Fallon B, *et al.* Nature and severity of physical harm caused by child abuse and neglect: results from the Canadian Incidence Study. *CMAJ* 2003;169:911–5.
- Australian Bureau of Statistic. *Census Date for Australia* 2011;2011.
- Chand A. The over-representation of Black children in the child protection system: possible causes, consequences and solutions. *Child Family Social Work* 2000;5:67–77.
- Euser EM, van Ijzendoorn MH, Prinzie P, *et al.* Elevated child maltreatment rates in immigrant families and the role of socioeconomic differences. *Child Maltreat* 2011;16:63–73.
- Fontes LA. *Child Abuse and Culture: Working with Diverse Families*. New York: The Guildford Press, 2005.
- Raman S, Hodes D. Cultural issues in child maltreatment. *J Paediatr Child Health* 2012;48:30–7.
- Raman S, Hotton P. Children of colour and child protection medical assessments: Improving cultural competency in clinical practice. 21st ISPCAN International Congress on Child Abuse and Neglect; *Calgary, Canada* 2016.
- Adams JA, Harper K, Knudson S, *et al.* Examination findings in legally confirmed child sexual abuse: it's normal to be normal. *Pediatrics* 1994;94:310–7.
- Makoroff KL, Brauley JL, Brandner AM, *et al.* Genital examinations for alleged sexual abuse of prepubertal girls: findings by pediatric emergency medicine physicians compared with child abuse trained physicians. *Child Abuse Negl* 2002;26:1235–42.
- Heger A, Ticson L, Velasquez O, *et al.* Children referred for possible sexual abuse: medical findings in 2384 children. *Child Abuse Negl* 2002;26(6-7):645–59.
- Johnson CF, abuse Csexual *The Lancet* 2004;364:462–70.
- Adams JA. Medical evaluation of suspected child sexual abuse: 2011 update. *J Child Sex Abuse* 2011;20:588–605.
- Girardet R, Giacobbe L, Bolton K, *et al.* Unmet health care needs among children evaluated for sexual assault. *Arch Pediatr Adolesc Med* 2006;160:70–3.
- Thomas L. G164 Unmet health needs identified during child protection medical assessments and their follow-up: A one year retrospective review of medical reports. *Archives of Disease in Childhood* 2014;99(Suppl 1):A72–A3.
- Hansen LA, Mikkelsen SJ, Sabroe S, *et al.* Medical findings and legal outcomes in sexually abused children. *J Forensic Sci* 2010;55:104–9.
- Lindberg DM, Lindsell CJ, Shapiro RA. Variability in expert assessments of child physical abuse likelihood. *Pediatrics* 2008;121:e945–e953.
- Laskey AL, Sheridan MJ, Hymel KP. Physicians' initial forensic impressions of hypothetical cases of pediatric traumatic brain injury. *Child Abuse Negl* 2007;31:329–42.